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Introductory Comments

Applicant respectfully requests reconsideration and allowance in view of the following remarks. For the Examiner's convenience, all pending claims are set forth below.

1. (Previously presented) An ink-jet printing apparatus for printing a visible image on a print medium by discharging ink from a plurality of ink ejection print elements, comprising:

means for storing a first table indicating a pixel density distribution pattern where a pixel density distribution within predetermined pixels is patterned;

means for storing a second table indicating combinations of density distribution patterns of print pixels and the ink ejection print elements in correspondence with gray scale values;

designation means for designating a region consisting of a predetermined number of neighboring pixels from pixels that form an input image;

selection means for selecting the pixel density distribution pattern for the designated region from the first table; and

control means for controlling ejection/non-ejection of ink from the plurality of ink ejection print elements by looking up the second table in accordance with the pixel density distribution pattern selected by the selection means and a gray scale value thereof,

wherein said control means looks up the first and second tables on the basis of a value near a value obtained by dividing a sum total of gray scale values of pixels which form the region by the predetermined number of pixels.

Claim 2 (cancelled)

3. (Original) The apparatus according to claim 1, wherein said selection means selects the pixel density distribution pattern on the basis of a difference between a value of a pixel of interest of the pixels that form the region, and an average value of gray scale values of all pixels which form the region.

4. (Previously presented) The apparatus according to claim 1, wherein a plurality of combinations of density distribution patterns of the print pixels and ink ejection print elements are prepared for a single gray scale value, and said control means sequentially or randomly selects these combinations.

5. (Previously presented) The apparatus according to claim 1, wherein said control means controls an ink-jet printing method of discharging double ink droplets onto at least a single unit pixel, and prints the visible image by discharging one or a plurality of ink droplets onto the unit pixel.

6. (Previously presented) The apparatus according to claim 1, wherein said control means controls an ink-jet printing method of discharging ink droplets having at least two different dot sizes, and prints the visible image by discharging one or a plurality of ink droplets onto a unit pixel.

7. (Previously presented) The apparatus according to claim 1, wherein said control means controls an ink-jet printing method of discharging at least two multi-density ink droplets for the same hue, and prints the visible image by discharging one or a plurality of ink droplets onto a unit pixel.

8. (Previously presented) The apparatus according to claim 1, wherein the plurality of ink ejection print elements are integrated and aligned, and express a halftone image by causing a plurality of ink dots to land on substantially a single print pixel on the print medium when they are scanned a plurality of number of times in a scan direction different from an alignment direction while being moved relative to the print medium by a predetermined width in a direction different from the scan direction.

9. (Previously presented) An ink-jet printing method for printing a visible image on a print medium by discharging ink from a plurality of ink ejection print elements, comprising:

a first table providing step of providing a first table indicating a pixel density distribution pattern where a pixel density distribution within predetermined pixels is patterned;

a second table providing step of providing a second table indicating combinations of density distribution patterns of print pixels and the ink ejection print elements in correspondence with gray scale values;

a designation step of designating a region consisting of a predetermined number of neighboring pixels from pixels that form an input image;

a selection step of selecting a pixel density distribution pattern for the designated region from the first table; and

a control step of controlling ejection/non-ejection of ink from the plurality of ink ejection print elements by looking up the second table in accordance with the pixel density distribution pattern selected in the selection step and a gray scale value thereof,

wherein the control step includes the step of looking up the first and second tables on the basis of a value near a value obtained by dividing a sum total of gray scale values of pixels which form the region by the predetermined number of pixels.

Claim 10 (cancelled)

11. (Original) The method according to claim 9, wherein the selection step includes the step of selecting the pixel density distribution pattern on the basis of a

difference between a value of a pixel of interest of the pixels that form the region, and an average value of gray scale values of all pixels which form the region.

12. (Previously presented) The method according to claim 9, wherein a plurality of combinations of density distribution patterns of the print pixels and ink ejection print elements are prepared for a single gray scale value, and the control step includes the step of sequentially or randomly selecting these combinations.

13. (Previously presented) A computer readable memory that stores a program code of an ink-jet print process for printing a visible image on a print medium by discharging ink from a plurality of ink ejection print elements, comprising:

a program code of a first table providing step of providing a first table indicating a pixel density distribution pattern where a pixel density distribution within predetermined pixels is patterned;

a program code of a second table providing step of providing a second table indicating combinations of density distribution patterns of print pixels and the ink ejection print elements in correspondence with gray scale values;

a program code of a designation step of designating a region consisting of a predetermined number of neighboring pixels from pixels that form an input image;

a program code of a selection step of selecting a pixel density distribution pattern for the designated region from the first table; and

a program code of a control step of controlling ejection/non-ejection of ink from the plurality of ink ejection print elements by looking up the second table in accordance with the pixel density distribution pattern selected in the selection step and a gray scale value thereof,

wherein the control step includes the step of looking up the first and second tables on the basis of a value near a value obtained by dividing a sum total of gray scale values of pixels which form the region by the predetermined number of pixels.

14. (Previously presented) The apparatus according to claim 1, wherein the second table indicates a correspondence among the gray scale values, the pixel density distribution patterns and the ink ejection print elements to be used for printing.

15. (Previously presented) A printing apparatus for gray scale printing, comprising:

means for acquiring gray scale values of surrounding pixels of a print pixel to be printed;

means for comparing the gray scale values of the surrounding pixels and a gray scale value of the print pixel to be printed; and

means for determining a pattern positioning dots in the print pixel based on a result of said comparison means.

16. (Previously presented) The apparatus according to claim 15, wherein the gray scale value of the print pixel is an average value of gray scale values of all pixels within the print pixel.

17. (Previously presented) The apparatus according to claim 15, wherein the surrounding pixels are pixels at positions extending from four corners of the print pixel.

18. (Previously presented) The apparatus according to claim 15, wherein said determining means further determines a driving position of a print element corresponding to a type of ink.

19. (Previously presented) The apparatus according to claim 18, wherein said determining means determines the driving position of the print element by looking up a table.

20. (Previously presented) The apparatus according to claim 15, wherein said determining means determines the pattern by looking up a table.